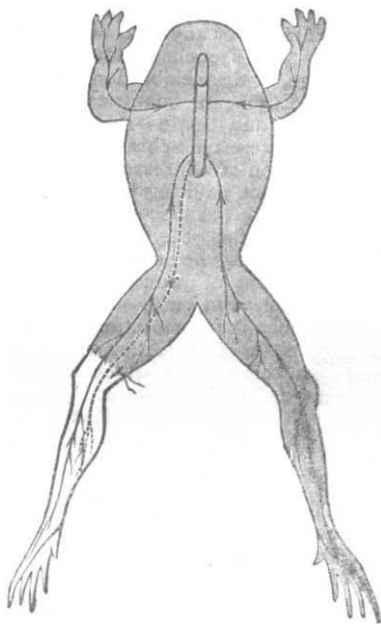


spinal cord and in all probability does so. The same arguments which would prove that woorara increases the susceptibility to pain prove also that morphia does so, for in small doses morphia also increases the movement of the leg of the frog in the same way as woorara; but we know perfectly well from observation in man that morphia does not increase pain even in small doses, and that a large dose completely abolishes it. There can be little doubt that large doses of woorara also abolish sensibility as well as motion, for after the poison has acted awhile, the movements, even in the protected leg, become less and less, showing that the spinal cord has been paralysed; but before this take place, the sensory nerves themselves are paralysed by the poison, as was first shown by Schiff, the correctness of whose experiments has been since confirmed. The mode of experiment will be better understood by reference to the accompanying diagram representing a frog, in which the artery going to one leg has been tied so as to protect it from the influence of the poison. This leg has been left unshaded, but all the



poisoned parts of the body are shaded. At first, pinching in any part of the body, whether poisoned or not, will induce movement in the non-poisoned leg, but after a little they do not, while pinching of the skin of the unpoisoned leg below the point of ligature will cause movements. This is most strikingly seen when the skin is pinched, first just above the ligature, and afterwards just below it. The pinch above the ligature produces no effect; the pinch below it produces movement. In the former case the sensory nerves have been poisoned by the woorara; in the latter case they have not. This experiment shows clearly that the ends of the sensory nerves are also paralysed by woorara like the ends of the motor nerves, although they are not so quickly affected, for a reference to the diagram will show that the trunks of both motor and sensory nerves and the spinal cord have been equally exposed to the poison, and that the only difference between the skin just above the ligature and just below it is that the ends of the sensory nerves above it have been poisoned, and those below it have not been poisoned. It is therefore almost certain that woorara in large doses diminishes, and finally abolishes all susceptibility to pain, as well as all power of motion, and that it may be looked upon as an anæsthetic, although not so powerful as chloroform, ether, or morphia.

NOTES

THE American Association for the Advancement of Science will hold its thirty-first annual meeting in Montreal during the week beginning Wednesday, August 23, 1882, under the presidency of J. W. Dawson, LL.D., F.R.S. A large attendance is expected from the United States and Canada, and it is hoped that there will be a good number of visitors from the British Islands and Continental Europe. The new Redpath Museum of the University, then to be opened, will contain remarkable collections, in part gathered for the occasion, illustrating American Geology and Archæology. The Allan and Dominion lines of steamers have placed at the disposal of the Local Committee a considerable number of passages from Liverpool to Quebec and back, at much reduced rates, and arrangements will be made for entertaining private visitors. Circulars, giving full particulars, will soon be issued, but meanwhile it is requested that any persons proposing to avail themselves of the occasion will communicate as soon as possible with Dr. T. Sterry Hunt, Montreal, Canada.

A LETTER has been received by one of the local secretaries of the British Association, intimating that Prince Leopold (Duke of Albany) had consented to accept the position of President of the Local Committee for the annual meeting of the British Association to be held at Southampton in the ensuing autumn. It is understood that the Earl of Carnarvon, the Bishop of Winchester, and Lord Northbrook, have agreed to act as Vice-Presidents. Answers have not yet been received from many other noblemen and gentlemen to whom similar invitations have been given.

WHAT a treasury of information the U.S. Census is compared with our own meagre enumeration. We have received, for example, five maps, with accompanying statistics, under the title of "Forestry Bulletin," showing the pine supply of Texas, Florida, Alabama, Mississippi, and Minnesota; doubtless the series will be completed. These maps not only show the area under pines, but also the distribution of the different species of pines, while, among other useful information, the text gives the number of feet standing.

WE can only this week announce the death of Sir Robert Christison; next week we shall give some particulars of his career.

THE Royal Society of New South Wales offers a prize for the best communication, containing the results of original research or observation, upon each of the following subjects:—Series I. (to be sent in not later than September 30, 1882). No. 1. On the Aborigines of New South Wales, 25/. No. 2. On the treatment of auriferous pyrites, 25/. No. 3. On the forage plants indigenous to New South Wales, 25/. No. 4. On the influence of the Australian climates and pastures upon the growth of wool, 25/. Series II. (to be sent in not later than August 31, 1883). No. 5. On the chemistry of the Australian gums and resins, 25/. No. 6. On water supply in the interior of New South Wales, 25/. No. 7. On the embryology and development of the marsupials, 25/. No. 8. On the Infusoria peculiar to Australia, 25/. The competition is in no way confined to members of the Society, nor to residents in Australia, but is open to all without any restriction whatever, excepting that a prize will not be awarded to a member of the Council for the time being; neither will an award be made for a mere compilation, however meritorious in its way—the communication to be successful must be either wholly or in part the result of original observation or research on the part of the contributor. The Society is fully sensible that the money value of the prize will not repay an investigator for the expenditure of his time and labour, but it is hoped that the honour will be regarded as a sufficient inducement and reward. The successful papers will be published in the Society's Annual Volume. Fifty reprint copies will be furnished to the author free of expense. It is the intention of the Society to offer additional prizes should this first attempt to encourage original

scientific investigation be reasonably successful. The Society deserves the highest credit for the enterprise, and we hope they will be encouraged to continue it.

It was lately announced that a German in Russia, Herr Dittmar, had found a way of solidifying petroleum, which would be of great commercial advantage. The method (we now learn from *Deut. Ind. Zeit.*) consists in heating petroleum in a still with 2, or at most 3, per cent. of soap. At first there is a great deal of foam; and at 100° the whole mass suddenly becomes like wax. For liquefaction afterwards vinegar is used. So far as yet appears, the invention is not applicable to raw naphtha. The distilled oils at Baku (on the Caspian) should be solidified, transported, and then submitted to further distillation. A lively discussion on the subject recently took place at the Russian Technical Society in St. Petersburg, and some objections raised by Prof. Wilchinski were not, it is said, adequately met by the inventor. It was urged, *inter alia*, that the solidifying did not wholly do away with leakage. When a piece of the solid petroleum is laid on blotting-paper, the latter absorbs some of the petroleum, and the solid piece loses weight. The same occurs with wood, and the proposed wooden cases, saturated during transport, might give off vapours which, mixing with air, would form explosive mixtures. If cases impermeable by petroleum were used instead, the advantage of the cheaper chests would fall away. Further, the consumption of soap (not a very cheap material) is considerable; thus 100,000 cwt. of petroleum would take 2000 cwt. of soap. The fatty matter need not indeed be lost, but it would be lost for the naphtha district, as the carriage back would not pay. Further, the solid petroleum could not be brought into the houses, but would require large central liquefying works, whence the liquid would be carried in vessels. Herr Dittmar's figures, showing a great advantage in the cost of transport of solid petroleum, were vigorously debated, and it was pointed out that the unloading of the chests was disadvantageous compared with the simple pumping from tanks.

Does the resistance of a gas to the motion of a solid body in it vary with the temperature when the density of the gas is kept perfectly constant? To this a negative answer has been given lately by M. Hirn, as the result of some ingenious experiments; and the deduction follows that the ideas at the base of the kinetic theory of gases must be given up, for according to that theory (Clausius) the resistance must vary, other things equal, in the direct ratio of the square root of the absolute temperature. M. Hirn, indeed, affirms "that the pressure and temperature of gases are not constituted by movements, of whatever kind, of material atoms." His experiments were made with a pendulum arrangement in a large globular vessel of glass, the pendulum consisting of a rectangular glass plate suspended by a steel wire, which passed up through a stopper of vulcanised caoutchouc. The temperature was varied between 11° and 50° C. In their reports on the memoir to the Belgian Academy, MM. Folie, Van der Mensbrugghe, and Melsens, while recognising the high merit of M. Hirn's researches, are still not prepared to accept his results. It is pointed out, *inter alia*, that the range of temperature is too limited. In M. Clausius' hypothesis, moreover, the law of resistance relates to *rectilinear* motion of a disc in an *indefinite* fluid, whereas the author experiments with *alternating* motion within a vessel *hermetically closed*. One of the reporters thinks the vessel should have been carefully weighed before and after the experiments. Once more the experiments of Meyer, Stefan, &c., on internal friction of gases have proved an incontestable influence of temperature. M. Hirn, in his memoir, indicates the far-reaching nature of his results, and their bearings on metaphysical questions. A *résumé* of this part of his argument is given by M. Melsens in his report (*Bull. Belg. Ac.*, Nos. 9 and 10).

It is just fifty years since the first number of *Chambers's Journal* was published, and its founder, Dr. Wm. Chambers, gives in the number for January some interesting reminiscences of its and his own long career. He has reason to be proud of both; his journal has done much to spread sound and healthy knowledge, and all along in its pages science has had its place. The house of which Dr. Chambers is the venerable head has through its many publications, a large proportion of which are scientific, had no inconsiderable share in fostering and promoting the now widespread desire for thorough popular education.

It is interesting to observe that the nobles of Japan, whom superficial writers are accustomed to regard as an effete and useless class, are taking up with much vigour the question of education in Western knowledge among members of their own body. A few years ago a school for the sons of *Kwasoku* (the old *daimiô* class) was opened in Tokio. All the funds necessary for a large and handsome building were contributed by the nobles themselves, and education in Western methods by trained native and foreign teachers was commenced. A recent decree of the Mikado has ordered the establishment of a Senate and House of Representatives, and it is believed that the hereditary nobility, or a certain number of them will have seats in the upper house. In order to render them fit for these new duties, it has now been decided that all pupils graduating in the nobles' school above mentioned shall be sent abroad to study in Europe or America. It may be added that the great majority of the Japanese students in this and other foreign countries are now studying wholly at their own expense. This interesting fact would go to show that the thirst for Western knowledge in Japan is widespread; otherwise the relations of these young men would not spend the comparatively large sums required for their maintenance abroad.

THE latest information from the East shows the existence of wide-spread seismic disturbance of an unusual kind. Details of a destructive earthquake in the Chinese province of Kansuh have been received. At one place (Kanchou) 42 persons were killed and 27 injured. One hundred houses also were destroyed, and 120 animals killed. At Chieichou the damage was much greater, 347 persons were either killed or injured, and 300 animals killed. As frequently occurs on these occasions, the disturbance was followed by an inundation which caused such destruction that the Emperor has been petitioned to remit all taxes and dispense charity. From the Philippine islands we receive news of a violent eruption of the volcano of Mayon, which has ruined many cocoa-nut plantations and caused much alarm. The whole island of Ceylon has also been visited by an earthquake, which, however, did little damage.

WE are glad to observe that the King of Siam is vigorously extending education throughout his territory. He has recently erected two new schools in Bangkok. At one of these, where English is taught, a number of his Majesty's sons and brothers are among the pupils. At the other school only the vernacular is taught.

AS we anticipated in NATURE a short time ago, the Chinese telegraph lines have been thrown open to the public, but no one could have been prepared for the manner in which this was done. The authorities have taken into consideration the fact that telegraphic communication is new in China, and that its advantages will make their way slowly among the people at first unless some vigorous steps were taken to make them known. They have accordingly decided to give the public free use of the lines for one month. This bold and wise measure will, we doubt not, be fully justified by the result.

A ROUMANIAN engineer, M. Theodorescu, has invented a submarine ship, before which all similar inventions are said to

pale. This ship, according to the statement of the inventor, can be guided for twelve hours completely under water, the depth of immersion varying between 100 and 300 feet at the option of the commander. Upon the surface the ship can be managed like any other vessel, its rate of speed, however, being less than that of ordinary steamers. The diving is done by means of screws, vertically, and can be accomplished suddenly or gradually. In the same manner the ship can be made to emerge from the water. When the vessel is under water, enough light is supplied to enable those on board to see any obstacle 130 feet ahead, and to regulate the ship's motion accordingly. The air supplied to the vessel is said to suffice for the whole crew for about twelve to fourteen hours. In case of need the air reservoir can be filled again, even under water, by means of telescopic tubes sent up to the surface. The progress of the vessel, as well as the diving, are said to be absolutely noiseless. We give all these details from the inventor's statement with due reserve, but should they prove true, the invention would be likely to prove a highly valuable one even for peaceable objects, apart from its great utility in naval warfare.

It is announced that, at the instance of the Marquis of Lorne, the initiatory steps have been taken for the establishment of an academy of eminent literary and scientific men in Canada, after the plan of the Assembly of the Immortals in France. The proposed body is to be composed of six sections, representing English and French letters, history and archæology, and the mathematical, physical, geological, and biological sciences. It is probable that there will be ten or twelve members in each section. Dr. Dawson is spoken of as the first president.

THE Boston Society of Natural History have published in a separate form various papers on the Palæolithic implements of the valley of the Delaware.

PROF. KIRCHHOFF, of Hallé-a-S., announced at the last meeting of the Saxo-Thuringian "Verein für Erdkunde" that the second German Geographical Congress will take place at Halle during the current year. A committee has been formed.

ON the day following his resignation as Minister M. Paul Bert was nominated president of the Société de Biologie, filling the room which had been vacated by the death of Claude Bernard.

A SLIGHT shock of earthquake was noticed at Agram on January 9 at 2.29 a.m.

WITH regard to the *Jeannette* expedition the latest news received at St. Petersburg, January 28, from Irkutsk, states that Mr. Melville has started for the mouth of the River Lena to resume the search for Lieut. De Long. The search will be carried on with the utmost vigour with the aid of the natives. The supply of provisions is plentiful, so that if necessary the search may be prolonged until far into the summer. Mr. Melville will be accompanied on his expedition by the captain of the steamer *Lena*.

At the meeting of the Geographical Society on February 13 Sir Richard Temple, Bart., G.C.S.I., formerly Governor of Bombay, will deliver a lecture on the Geography of the Birth-place and Cradle of the Mahratta power in Western India. The lecture will be illustrated by the author's own sketches, which have been enlarged for the occasion by his brother, Lieut. G. T. Temple, R.N.

FROM the *Compte Rendu des Séances*, just issued by the French Geographical Society, we learn that at their next meeting on February 3, some interesting letters will be read, including one from Dr. Crevaux, who is about to explore the sources of the Pilcomayo in the Bolivian Andes, and afterwards descend the river to its mouth. A paper will also be read by Col. Veniukoff on the unexplored parts of Asia.

THE Moscow Society of Naturalists have appointed a special Commission to inquire into the influence of the decrease of forests on rivers and streams. This Society intend to celebrate, on May 14 next, the fiftieth anniversary of the doctorate of their vice-president, M. Charles Renard, who has for forty-two years rendered eminent service to the Society as well as to science.

AN important meeting of the Executive Committee of the Parkes Museum was held on Friday, Prof. Berkeley Hill in the chair. The Curator, Mr. Mark H. Judge, as Secretary of the recent International Medical and Sanitary Exhibition, presented the final report of the Exhibition Committee, which, after giving a detailed account of the origin and success of the undertaking, concluded as follows:—"The work for which the Exhibition Committee were appointed having now come to an end, they have the satisfaction of handing over to the Executive Committee of the Museum the sum of 933*l.* 11*s.*, together with furniture and fittings to the value of 100*l.*, while contributions to the Guarantee Fund to the amount of 86*l.* 19*s.* have been transferred to the Parkes Museum Building Fund, making the financial result of their labours a profit to the Parkes Museum of 1,120*l.*" The Honorary Secretary, Dr. G. V. Poore, read a communication from the Council of University College, in which that body agreed, with some modifications, to proposals which had been made in behalf of the Museum to the Council of the College in reference to the erection of a building for the Museum. After a long discussion the modifications suggested by the Council of University College were accepted, and it was resolved that steps should be taken to obtain the funds necessary for carrying out the scheme, which embraces (1) the building of an addition to the north wing of the College for the purposes of the Museum; (2) an endowment for the maintenance and management of the Museum; (3) the Museum to be opened free to the public and to be placed on a somewhat similar footing to the North London Hospital, *i.e.* to be autonomous, with due representation of the Council of University College on the Executive Committee of the Museum. It is estimated that 30,000*l.* is the sum that will be required thus permanently to establish the Museum as a national institution. Towards this Mr. Thomas Twining of Twickenham, had written to say that he would subscribe the sum of 100*l.* if one hundred promises of a similar amount were obtained. Promises of subscriptions may be sent to the Curator at the Parkes Museum, University College, Gower Street. Subscriptions may be paid to the account of the Parkes Museum at the Union Bank, Argyl Place, Regent Street.

THE additions to the Zoological Society's Gardens during the past week include a Toque Monkey (*Macacus pileatus* ♂) from Ceylon, presented by Mrs. Evans; an Azara's Fox (*Canis azarae*) from South America, presented by Mr. Owen E. Grant; an Indian Vulture (*Cyps, bengalensis*) from India, presented by Capt. Th. Leportier; a Chimpanzee (*Anthropopithecus troglodytes* ♀) from West Africa, deposited.

OUR ASTRONOMICAL COLUMN

THE OBSERVATORY OF HARVARD COLLEGE, U.S.—The Annual Report of the proceedings of this Observatory, presented to the visiting Committee in November last by the present zealous director, Prof. Pickering, has been issued. Aided by the subscription raised in 1878 for the support of the Observatory for five years, the director has been enabled to keep the establishment in great activity, and his Report will be a gratifying proof that the funds placed so liberally by subscribers at his disposal are being dispensed in a manner that must prove of great advantage to the progress of astronomical research. Three instruments the equatorial of 15-inches aperture, the meridian circle, and the meridian photometer, have been kept in active